
जिलेटिन, खाद्य ग्रेड — विशिष्टि
(दूसरा पुनरीक्षण)

Gelatin, Food Grade —
Specification
(Second Revision)

ICS 67.220.20

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FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Food Additives Sectional Committee had been approved by the Food and Agriculture Division Council.

Gelatin is widely used in the food processing industry as a stabilizer, gelling agent, emulsifying agent and a crystallization inhibitor. It is permitted as a food additive under the *Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011*.

This standard was first published in 1970 to guide the indigenous manufacturers in making their product conform to international specifications. This standard was revised in 2005 to update and align with the JECFA specification for gelatin specifically with regards to the limits for heavy metal contaminants and methods of test. This revision is now being undertaken to harmonize the standard with the existing JECFA specification with respect to lead, mercury and cadmium. Limits for chromium has been added as per the draft notification in FSSAI Regulations. The requirement of *E. Coli* has been replaced by *Enterobacteriaceae* or bacteria of the *coli-aerogenes* group as per the latest JECFA specification.

In the formulation of this standard, due consideration has been given to the provisions of the *Food Safety and Standards Act, 2006* and the *Rules and Regulations* framed thereunder and the *Legal Metrology (Packaged Commodities) Rules, 2011*. However, this standard is subject to the restrictions imposed under these, wherever applicable.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

GELATIN, FOOD GRADE — SPECIFICATION

(*Second Revision*)

1 SCOPE

This standard prescribes requirements and methods of sampling and test for gelatin, food grade which is also known as edible gelatin.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
1699 : 1994	Methods of sampling and test for food colours (<i>second revision</i>)
2491 : 2013	Food Hygiene — General Principles — Code of Practice (<i>third revision</i>)
4706 (Part 2) : 1978	Methods of tests for edible starches and starch products: Part 2 Chemical methods
5306 : 1996	Sodium Carboxymethyl Cellulose, Food Grade (<i>second revision</i>)
5402 : 2012	Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of micro-organisms — Colony count technique at 30°C by pour plate technique (<i>third revision</i>)
5887 (Part 2) : 1976	Methods for detection of bacteria responsible for food poisoning: Part 2 Isolation, identification and enumeration of <i>staphylococcus aureus</i> and <i>faecal streptococci</i> .
7219 : 1973	Method for determination of protein in foods and feeds
IS/ISO 7402 : 1993	‘Microbiology — General guidance for the enumeration of Enterobacteriaceae without resuscitation — MPN technique and colony — Count technique
7928 : 1992	Alginic acid, Food grade

3 DEFINITION

3.1 Gelatin

Gelatin is a protein produced-by partial hydrolysis of

collagen derived from skin, tendons, ligaments and bones of animals.

4 REQUIREMENTS

4.1 Description

4.1.1 Gelatin shall be in the form of sheets, flakes, shreds or coarse to fine powder. It shall be faint yellow or amber in colour, the shade varying in depth according to particle size.

4.1.2 It shall have very slight odour and taste but not objectionable which is characteristic and bouillon like. It is stable in air when dry but is subject to microbial decomposition when moist or in solution.

4.2 Identification

4.2.1 Solubility

Gelatin is practically insoluble in cold water but shall swell and soften when immersed in it, gradually absorbing from 5 to 10 times its own weight of water. It is soluble in hot water; forming a jelly on cooling; and in acetic acid (approximately 5 N).

Gelatin is practically insoluble in alcohol (95 percent), in chloroform, solvent ether and fixed and volatile oils.

4.2.2 Precipitate formation

To a solution (1 in 100) add trinitrophenol TS or a solution of potassium dichromate (1 in 15) previously mixed with about one-fourth its volume of dilute hydrochloric acid: a yellow precipitate is formed.

To a solution (1 in 100) add mercuric nitrate solution; a white precipitate is formed which develops a brick red colour on warming.

4.2.3 Development of turbidity

To a solution (1 in 5 000) add tannic acid TS; the solution becomes turbid.

4.2.4 When heated with soda lime, ammonia is evolved

4.3 The product shall also conform to the requirements given in Table 1.

4.4 The product shall be processed, packed, stored and distributed under hygienic conditions in licensed premises (*see* IS 2491).

4.5 Microbiological Requirements

4.5.1 *Enterobacteriaceae* or bacteria of the *coli-aerogenes* group shall not exceed 10/g when tested in accordance with the method given in IS/ISO 7402 : 1993.

4.5.2 *Faecal Streptococci* shall not exceed 100/g when tested in accordance with the method given in IS 5887 (Part 2) : 1976.

4.5.3 The total viable colony count shall not exceed 10000/g when tested in accordance with the method given in IS 5402 : 2012.

5 PACKING, STORAGE AND MARKING

5.1 Packing

The product shall be filled in air tight glass or any other containers. The containers shall be hermetically sealed to prevent contamination of the contents with metals or other impurities.

5.2 Storage

The product shall be stored in a cool and dry place so as to avoid excessive exposure to heat.

5.3 Marking

Each container shall be legibly and indelibly marked with the following information:

- Name of the material;
- Name and address of the manufacturer;
- Batch or Code No;
- Net quantity when packed;
- Instruction for storage;
- Best before date (month & year to be given by the manufacturer); and
- Any other requirements as specified under the *Legal Metrology (Packaged Commodities) Rules, 2011* and *Food Safety and Standards (Packaging and Labelling) Regulation, 2011* and the Rules framed thereunder.

5.3.1 BIS Certification Marking

The product may also be marked with the Standard Mark.

5.3.2 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

6.1 The representative samples of the material shall be drawn according to the method prescribed in 4 of IS 1699.

Table 1 Requirements for Gelatin
(Clause 4.3)

Sl No. (1)	Characteristic (2)	Requirement (3)	Method of Test, Ref to (4)
i)	Loss on drying, percent by mass, Max	18.0	Annex C of IS 5306
ii)	Gel strength	To pass the test	Annex A
iii)	Total Ash, percent by mass, Max	2	A4 of IS 7928
iv)	Sulphur dioxide, mg/kg, Max	40	11 of IS 4706 (Part 2)
v)	Nitrogen (on dry basis), percent by mass, Min	15	IS 7219
vi)	Lead (as Pb), mg/kg, Max	1.5	15 of IS 1699
vii)	Arsenic (as As), mg/kg, Max	1	15 of IS 1699
viii)	Mercury (as Hg), mg/kg, Max	0.15	15 of IS 1699
ix)	Cadmium (as Cd), mg/kg, Max	0.5	15 of IS 1699
x)	Chromium (as Cr), mg/kg, Max	10	15 of IS 1699
xi)	Heavy Metals (as Pb), mg/kg	50	16 of IS 1699

ANNEX A*[Table 1, Sl. No. (ii)]***DETERMINATION OF GEL STRENGTH****A-1 PROCEDURE**

Weigh accurately about 1 g and place with 99 of water in a 200 ml flask. Allow to stand for 15 min; then place the flask in a water-bath at 60 °C, and swirl occasionally until solution is complete. Transfer 10 ml of the solution to a test-tube having an internal diameter of

12 mm and place the tube in an ice-bath, making certain that the top of the solution is below the level of the ice and water. Place the bath containing the tube in a refrigerator, and maintain it at about 0 °C for 6 h. When the tube is removed from the bath and inverted, no movement of the gel shall be observed.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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